ARCADIS Design & Consultancy for natural and built assets

Mr. Eugene Melnyk, PE
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue
Buffalo, New York 14203-2915

Arcadis of New York, Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Tel 315 446 9120
Fax 315 449 0017
www.arcadis.com

ENVIRONMENT

Subject:
Groundwater Sampling Report
ExxonMobil Oil Former Buffalo Terminal OU-2 East
503/625/635 Elk Street
Buffalo, New York 14210
NYSDEC Site No. C915201B

Date:
February 28, 2019

Contact:
Michael Benoit, PE

Phone:
315.671.9298

Email:
michael.benoit@arcadis.com

Our ref:
B0085953.1802.00009

Dear Mr. Melnyk:

This letter has been prepared by Arcadis of New York, Inc. (Arcadis), on behalf of ExxonMobil Environmental and Property Solutions Company (ExxonMobil), to present the scope and results of the groundwater sampling activities conducted on June 28, 2018 at the ExxonMobil Oil Former Buffalo Terminal Operable Unit 2 (OU-2) East site (hereinafter, the "Site") in Buffalo, New York. The work was conducted pursuant to the New York State Department of Environmental Conservation's (NYSDEC's) *Request for Sampling of Emergent Contaminants* (NYSDEC 2018) and in accordance with the *Groundwater Sampling Work Plan – OU-2 East* (Groundwater and Environmental Services, Inc. 2018), which was approved by NYSDEC on June 11, 2018.

Groundwater samples were collected on June 28, 2018 from monitoring wells B-2MW, MW-34, MW-49, and MW-50 (Figure 1). At each well, an oil-water interface probe was used to measure the depth to groundwater and evaluate the presence/absence of non-aqueous phase liquid. Non-aqueous phase liquid was not detected in any of the monitoring wells subject to sampling. Groundwater samples were collected using low-flow purging and sampling procedures in general conformance with NYSDEC's *Collection of Groundwater Samples for Perfluorooctanoic Acid (PFOA) and Perfluorinated Compounds (PFC) from Monitoring Wells Sample Protocol* (NYSDEC 2016). Copies of the groundwater sampling logs are provided in Attachment A of this letter.

Groundwater samples were submitted to Eurofins Lancaster Laboratories Environmental, LLC of Lancaster, Pennsylvania for analysis of per- and polyfluoroalkyl substances and 1,4-dioxane in accordance with United States Environmental Protection Agency Modified Method 537, Version 1.1 and United States Environmental Protection Agency SW-846 Method 8270D SIM, respectively. The results of the above analyses are summarized in Table 1. The laboratory data report (NYSDEC Analytical Services Protocol Category B data deliverable) and data usability summary report for the groundwater sample data are provided in Attachments B and C, respectively.

Please do not hesitate to contact me if you have any questions or require additional information.

Sincerely,

Arcadis of New York, Inc.

Michael Benoit, PE
Principal Environmental Engineer

Copies:
Chad Staniszewski, PE, NYSDEC
Elizabeth Zinkevicz, ExxonMobil
Krista Manley, Buckeye Partners, LP
Paul Neureuter, Elk Street Commerce Park, LLC

Enclosures:

Tables

1 Summary of Groundwater Sample Results

Figures

1 Site Plan

Attachments

A Low-Flow Groundwater Sampling Logs

B Laboratory Data Report

C Data Usability Summary Report

References:

Groundwater and Environmental Services, Inc. 2018. *Groundwater Sampling Work Plan – OU-2 East*. ExxonMobil Oil Former Buffalo Terminal OU-2 East, Buffalo, New York. Prepared for ExxonMobil. May 24.

NYSDEC. 2016. *Collection of Groundwater Samples for Perfluorooctanoic Acid (PFOA) and Perfluorinated Compounds (PFC) from Monitoring Wells Sample Protocol*. Revision 1.2. June 29.

NYSDEC. 2018. *Request for Sampling of Emerging Contaminants*. ExxonMobil Oil Former Buffalo Terminal, Buffalo, New York. Division of Environmental Remediation. April 12.

Tables

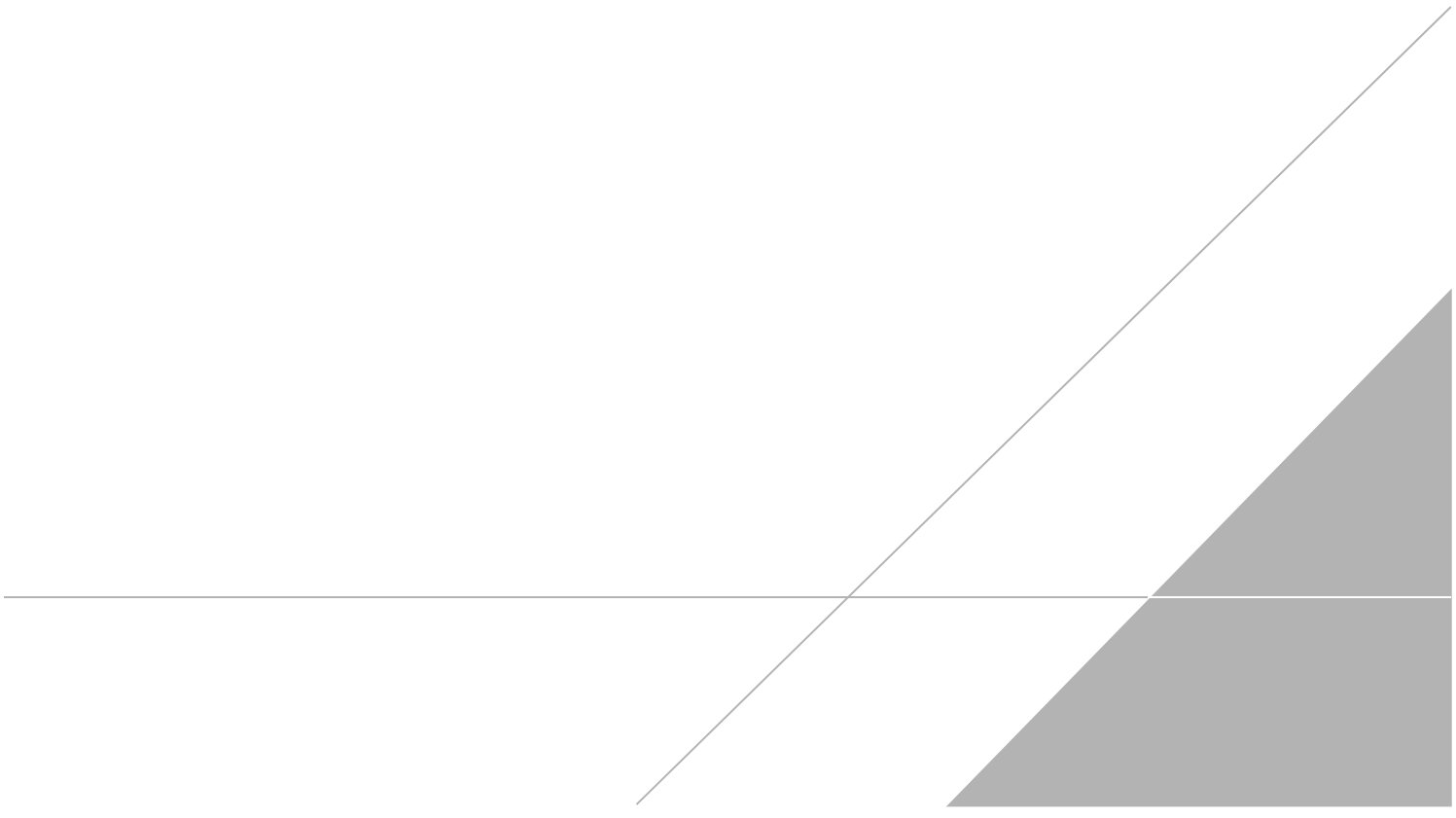


Table 1
Summary of Groundwater Sample Results

ExxonMobil Oil Former Buffalo Terminal OU-2 East
503/625/635 Elk Street
Buffalo, New York 14210

Parameter	Location ID: / Sample ID: / Sample Date:	Units	B-2MW / B-2MW / 6/28/2018	MW-34 / MW-34 / 6/28/2018	MW-34 / DUP-062818-OU2E / 6/28/2018	MW-49 / OU-2 East / 6/28/2018	MW-50 / OU-2 East / 6/28/2018
Semivolatile Organic Compounds (USEPA SW-846 Method 8270D SIM)							
1,4-Dioxane		µg/L	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Per- and Polyfluoroalkyl Substances (USEPA Method 537 Version 1.1 Modified)							
Perfluorobutanesulfonate		ng/L	**8.8 J**	**1.4 J**	**0.77 J**	**7.3 J**	**3.1**
Perfluorohexanesulfonate		ng/L	**19**	**17**	**18**	**3.0 J**	**2.8 J**
Perfluoroheptanesulfonate		ng/L	5.0 U	**1.1 J**	**1.0 J**	3.4 U	5.0 U
Perfluorooctanesulfonate		ng/L	**16**	**65**	**61**	**4.2**	**11**
Perfluorodecanesulfonate		ng/L	5.0 U	3.3 U	3.3 U	3.4 U	5.0 U
Perfluorobutanoic acid		ng/L	**28 J**	9.9 U	10 U	**110 J**	**9.7 J**
Perfluoropentanoic acid		ng/L	15 UJ	9.9 U	10 U	**7.8 J**	15 U
Perfluorohexanoic acid		ng/L	**5.8**	**1.6 J**	**2.4 J**	**7.7**	**4.9 J**
Perfluoroheptanoic acid		ng/L	**3.5**	**2.0**	**1.8**	**3.0**	**11**
Perfluorooctanoic acid		ng/L	**7.3**	**3.7**	**3.3**	**12**	**14**
Perfluorononanoic acid		ng/L	**4.1 J**	**3.6**	**3.4**	**2.6 J**	**150**
Perfluorodecanoic acid		ng/L	5.0 U	3.3 U	3.3 U	3.4 U	**5.6**
Perfluoroundecanoic acid		ng/L	5.0 U	3.3 U	3.3 U	3.4 U	**5.3**
Perfluorododecanoic acid		ng/L	5.0 U	3.3 U	3.3 U	3.4 U	5.0 U
Perfluorotridecanoic acid		ng/L	2.5 U	1.6 U	1.7 U	1.7 U	2.5 U
Perfluorotetradecanoic acid		ng/L	2.5 U	1.6 U	1.7 U	1.7 U	2.5 U
6:2 fluorotelomersulfonate		ng/L	5.0 U	3.3 U	3.3 U	3.4 U	5.0 U
8:2 fluorotelomersulfonate		ng/L	15 U	9.9 U	10 U	10 U	15 U
Perfluorooctanesulfonamide		ng/L	7.4 U	4.9 U	5.0 U	5.1 U	7.5 U
N-methyl perfluorooctanesulfonamidoacetic acid		ng/L	7.4 U	4.9 U	5.0 U	5.1 U	7.5 U
N-ethyl perfluorooctanesulfonamidoacetic acid		ng/L	7.4 U	4.9 U	5.0 U	5.1 U	7.5 U

Notes:

1. Bolded sample concentrations denote detected parameters.
2. ng/L: nanograms per liter.
3. µg/L: micrograms per liter.

Data Qualifiers:

1. J: Concentration is less than the reporting limit (RL), but greater than or equal to the method detection limit. The reported concentration is an estimate.
2. U: Parameter was not detected in the sample. The reported concentration is the RL.
3. UJ: Parameter was not detected above the reported RL. However, the reported RL is approximate and may or may not represent the actual RL.

Figures

BABCOCK ST.

PARCELS #1, #2 AND #3

GORHAM STREET

PARCEL #4

WINONA STREET

PARCEL #5

BRADFORD STREET

ELK STREET

ELK STREET

BABCOCK STREET

BABCOCK ST. SEWER

B-1MW

MW-34

MW-35

OU-2 East – BCP Site No. C915201B

MW-49

WATER METER HOUSE

23

B-2MW

MW-47

MW-48

MW-38

22

SB-28

MW-26

PRENATT STREET

MW-51

MW-52

150

146

152

SB-16

SB-19

SB-20

MW-31

B-5MW(RR)

MW-17

OU-3 – BCP Site No. C915201D

153

MW-46

73

MW-9

MW-36R

MW-50

MW-29

MH-4

MW-5

MW-8

MW-30

RW-5

112

MW-16

69

MW-37

ADDITIVE TANKS

0 150’ 300’

GRAPHIC SCALE

LEGEND

- EXISTING TANK
- 153 EXISTING STRUCTURE
- MW-1 LOCATION AND DESIGNATION OF MONITORING WELL
- RW-5 LOCATION AND DESIGNATION OF RECOVERY WELL
- WELL POINT SYSTEM
- SECTION OF WELL POINT SYSTEM NOT OPERATIONAL
- BCP SITE BOUNDARY
- SAMPLE LOCATION

EXXONMOBIL ENVIRONMENTAL AND PROPERTY SOLUTIONS COMPANY
EXXONMOBIL OIL FORMER BUFFALO TERMINAL OU-2 EAST
CITY OF BUFFALO, ERIE COUNTY, NEW YORK

GROUNDWATER SAMPLING REPORT

SITE PLAN

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

Attachments

Attachment A

Low-Flow Groundwater Sampling Logs

ARCADIS Design & Consultancy for natural and built assets

GROUNDWATER SAMPLING LOG

Project No. B0085953.1802 Well ID B-2MW Date 6/28/18

Project Name/Location ExxonMobil Former Buffalo Terminal Weather 70, overcast

Measuring Pt. Description TIC Screen Setting (ft-bmp) 4.1-16.1 Casing Diameter (in.) 2 Well Material X PVC ___ SS

Static Water Level (ft-bmp) 3.19 Total Depth (ft-bmp) 15.14 Water Column/ Gallons in Well 11.95' / 1.95 gal

MP Elevation ___ Pump Intake (ft-bmp) 10 Purge Method: Peristaltic / Centrifugal / Submersible / Other

Pump On/Off 0945 / 1030 Volumes Purged 1.5 Sample Method Low Flow

Sample Time: Label 1025 Start 1025 End 1030 Replicate/ Code No. /

PID = 0.0 ppm

Sampled by A. Geege, J. Dignette

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (mMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
0950	5	400	3.47	0.5	9.33	0.892	11.5	0.17	15.19	-204.2	colorless	odorless
0955	10	300	3.58	0.9	9.33	0.880	9.72	0.46	15.69	-206.3	"	"
1000	15	300	3.53	1.3	9.35	0.897	8.18	0.36	16.56	-207.6	"	"
1005	20	300	3.53	1.7	9.37	0.903	8.52	0.25	16.98	-206.3	"	"
1010	25	300	3.53	2.1	9.36	0.900	9.57	0.18	17.32	-204.6	"	"
1015	30	300	3.53	2.5	9.37	0.908	9.70	0.13	17.61	-203.3	"	"
1020	35	300	3.53	2.9	9.36	0.906	10.58	0.09	17.70	-202.5	"	"
1025	Sampled											
	Dup											

Constituents Sampled	Container	Number	Preservative
PFAS	250 mL HDPE	2	None
1,4-Dioxane	250 mL amber	2	None

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: OW-2 ~~West~~ East

Condition of Well: good

Well Completion: Flush Mount / Stick Up

Well Locked at Arrival: Yes / No

Well Locked at Departure: Yes / No

Key Number To Well:

ARCADIS Design & Consultancy for natural and built assets

GROUNDWATER SAMPLING LOG

Project No. B0085953.1802 Well ID MW-34 Date 6/28/18

Project Name/Location ExxonMobil Former Buffalo Terminal Weather 70, overcast

Measuring Pt. Description TIC Screen Setting (ft-bmp) 4-12 Casing Diameter (in.) 4 Well Material X PVC ___ SS

Static Water Level (ft-bmp) 5.38 Total Depth (ft-bmp) 12.60 Water Column/ Gallons in Well 7.22' / 4.7gal

MP Elevation ___ Pump Intake (ft-bmp) 9 Purge Method: Peristaltic Centrifugal ___ Submersible ___ Other ___ Sample Method Low Flow

Pump On/Off 1217/1315 Volumes Purged 0.75

Sample Time: Label 1300 Start 1300 End 1315 Replicate/ Code No. DUP-062818-OU2E MW-34 MS/MSD

PID: 0.3ppm

Sampled by A. George J. Ayotte

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (mMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1220	0	300	5.40	0	10.30	1.088	~~1.028~~	1.02	17.47	-211.0	no	Slight
1225	5	300	5.42	0.5	9.98	0.821	9.86	1.18	18.55	-173.4	no	no
1230	10	300	5.43	1.0	9.94	0.694	11.2	1.65	19.30	-136.5	"	"
1235	15	300	5.43	1.5	9.89	0.645	10.0	2.02	19.44	-114.2	"	"
1240	20	300	5.43	2.0	9.88	0.634	9.31	1.92	19.79	-105.2	"	"
1245	25	300	5.43	2.5	~~9.88~~ 9.88	0682	9.10	1.64	20.20	-100.8	"	"
1250	30	300	5.43	3.0	9.88	0.677	8.99	1.59	20.25	-96.6	"	"
1255	35	300	5.43	3.5	9.88	0.684	8.41	1.58	20.25	-97.3	"	"

Constituents Sampled	Container	Number	Preservative
PFAS	250mL HDPE	2+2+4	None
1,4-Dioxane	250mL amber	2+2+4	None

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

Well Information

Well Location: OU2 - East Well Locked at Arrival: Yes / (No)

Condition of Well: ___ Well Locked at Departure: Yes / (No)

Well Completion: Flush Mount / (Stick Up) Key Number To Well: ___

ARCADIS Design & Consultancy for natural and built assets

GROUNDWATER SAMPLING LOG

Project No. 30085953.1802 Well ID MW-49 Date 6/28/18

Project Name/Location ExxonMobil Former Buffalo Terminal Weather 75, Mostly cloudy

Measuring Pt. Description TIC Screen Setting (ft-~~bmp~~ bgs) 2-12.5 Casing Diameter (in.) 2 Well Material X PVC ___ SS

Static Water Level (ft-bmp) 3.43 Total Depth (ft-bmp) 15.45 Water Column/ Gallons in Well 12.02' / 1.96 gal

MP Elevation ___ Pump Intake (ft-bmp) 10 Purge Method: Peristaltic; Centrifugal; Submersible; Other

Pump On/Off 1340 / 1515 Volumes Purged 3.1 Sample Method Low Flow

Sample Time: Label 1510 Start 1510 End 1515 Replicate/ Code No. /

Sampled by A. George, J. Pigeatte

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (mMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1345	5	300	5.11	0.4	9.57	1.089	8.46	1.53	17.74	-225.3	colorless	odorless
1350	10	200	6.14	0.75	9.45	1.129	5.54	0.25	18.66	-224.8	light brown	"
1355	15	200	6.89	1.0	9.49	1.142	9.05	0.15	19.07	-222.3	"	"
1400	20	100	6.97	1.15	9.53	1.153	11.2	0.16	19.84	-228.6	"	"
1405	25	100	7.06	1.3	9.51	1.169	10.5	0.08	20.02	-230.6	"	"
1410	30	100	7.09	1.45	9.50	1.167	10.7	0.07	19.82	-230.8	"	"
1415	35	100	7.17	1.6	9.52	1.154	10.2	0.05	19.56	-228.5	"	"
1420	40	400	7.40	2.0	9.49	1.171	10.6	0.09	19.55	-224.1	"	"
1425	45	100	7.51	2.15	9.50	1.150	10.2	0.06	19.50	-223.7	"	"
1430	50	100	7.69	2.3	9.52	1.101	9.70	0.05	16.69	-221.1	"	"
1435	55	400	8.71	2.7	9.43	1.029	9.50	0.00	15.35	-204.6	"	"
1440	60	400	8.84	2.85	9.42	1.031	10.1	0.95	16.44	-203.4	"	"
* 1445	65	500	9.40	4	9.54	1.005	83.2	2.07	13.92	-203.2	"	"
1450	70	500	9.66	4.6	9.44	1.008	20.1	0.06	14.37	-204.1	"	"
1455	75	500	10.13	5	9.54	1.013	9.77	0.06	15.03	-208.1	"	"
1500	80	500	10.48	6	9.58	1.012	9.07	0.01	14.81	-198.6		

** 1510 sampled

Constituents Sampled	Container	Number	Preservative
PFAS	250 mL HDPE	2	None
1,4-Dioxane	250 mL amber	2	None

*** 3 well volumes reached.

* Lowered tubing. Will attempt to purge well dry & find stabilization point.

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

Well Information

Well Location: OW2 East Well Locked at Arrival: Yes / (No)

Condition of Well: good Well Locked at Departure: Yes / (No)

Well Completion: Flush Mount / (Stick Up) Key Number To Well:

ARCADIS Design & Consultancy for natural and built assets

GROUNDWATER SAMPLING LOG

Page 1 of 1

Project No. 30085953.1807 Well ID MW-50 Date 6/28/18

Project Name/Location ExxonMobil Former Buffalo Terminal Weather 65, overcast

Measuring Pt. Description TIC Screen Setting (ft-~~bmp~~ bgs) 2.5-12 Casing Diameter (in.) 2 Well Material ✓ PVC ___ SS

Static Water Level (ft-bmp) 3.50 Total Depth (ft-bmp) 15.15 Water Column/ Gallons in Well 11.65' / 1.90 gal

MP Elevation ___ Pump Intake (ft-bmp) 10 Purge Method: Peristaltic ___ Centrifugal ___ Submersible ___ Other ___ Sample Method Low Flow

Pump On/Off 0835 / 0925 Volumes Purged 0.8

Sample Time: Label 0920 Start 0920 End 0925 Replicate/ Code No. ✓ PID=0.0ppm Sampled by A. George J. Dupuette

Time	Minutes Elapsed	Rate (gpm) (~~mL/min~~)	Depth to Water (ft)	Gallons Purged	pH	Cond. (~~mMhos~~) (~~mS/cm~~)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (~~°C~~) (°F)	Redox (mV)	Appearance	
											Color	Odor
0840	5	350	3.74	0.45	6.62	0.678	59.8	2.29	17.89	150.3	colorless	odorless.
0845	10	350	3.87	0.9	7.04	0.689	38.0	1.29	18.10	131.0	"	"
0850	15	350	3.92	1.35	6.74	0.675	20.3	0.82	17.93	126.8	"	"
0855	20	350	3.93	1.80	6.67	0.663	M.3	0.77	17.88	124.9	"	"
0900	25	350	3.97	1.25	6.74	0.650	13.4	0.92	17.69	118.8	"	"
0905	30	350	3.98	1.7	6.70	0.642	12.5	0.66	17.53	119.3	"	"
0910	35	350	3.98	1.15	6.72	0.639	11.5	0.56	17.37	115.6	"	"
0915	40	350	3.98	1.6	6.80	0.638	11.0	0.47	17.29	110.7	"	"
0920	~~45~~	Sampled										

Constituents Sampled	Container	Number	Preservative
PFAS	250mL HDPE	2	None
1,4-Dioxane	250mL amber	2	None

Well Casing Volumes

Gallons/Foot 1" = 0.04 1.25" = 0.06 1.5" = 0.09 2" = 0.16 2.5" = 0.26 3" = 0.37 3.5" = 0.50 4" = 0.65 6" = 1.47

Well Information

Well Location: OU-2E Well Locked at Arrival: Yes / (No)

Condition of Well: ___ Well Locked at Departure: Yes / (No)

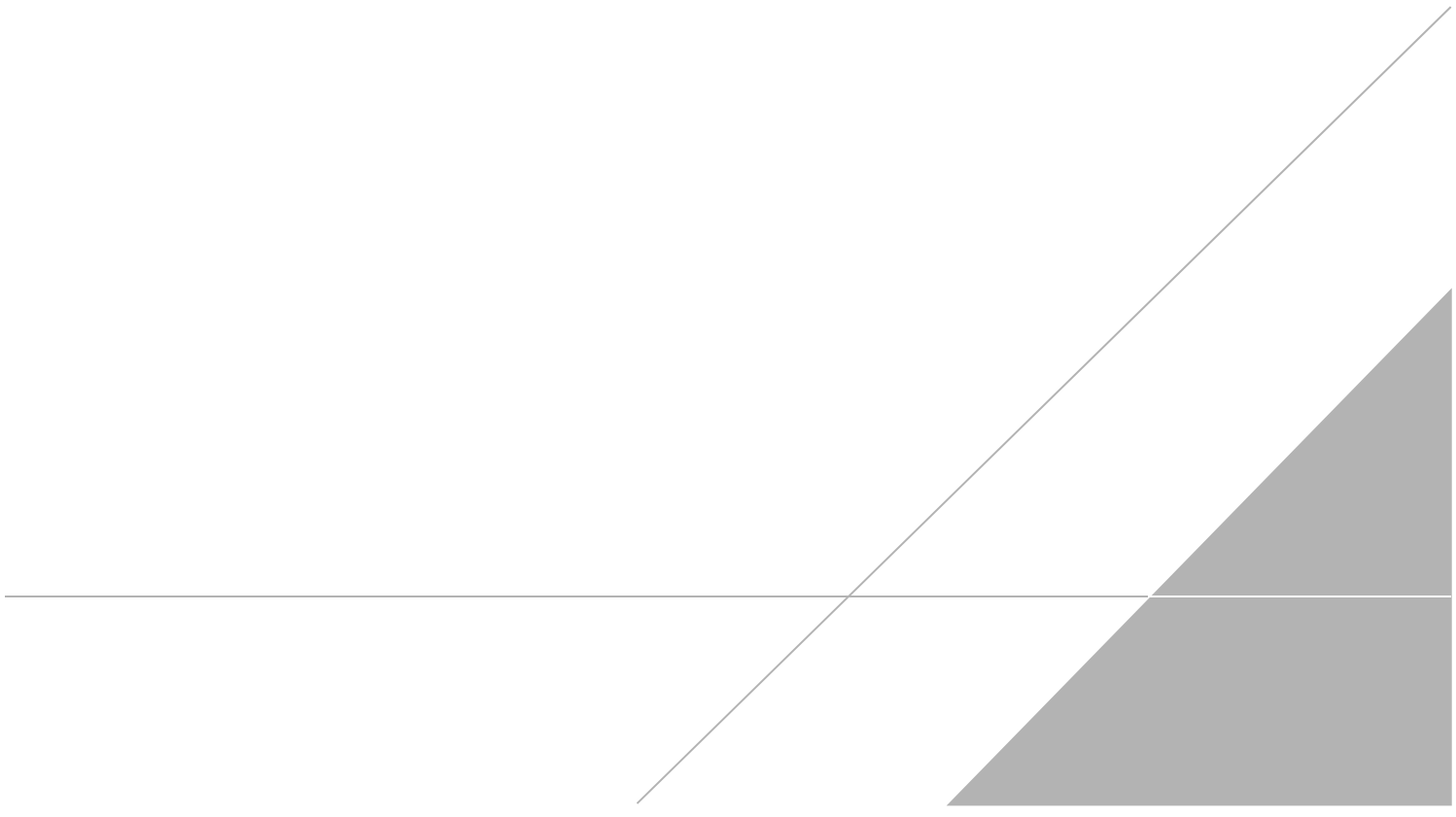
Well Completion: Flush Mount / (Stick Up) Key Number To Well: ___

Attachment B

Laboratory Data Report

Attachment C

Data Usability Summary Report



ARCADIS Design & Consultancy for natural and built assets

ExxonMobil-Buffalo Terminal

DATA USABILTY SUMMARY REPORT (DUSR)

Buffalo, New York

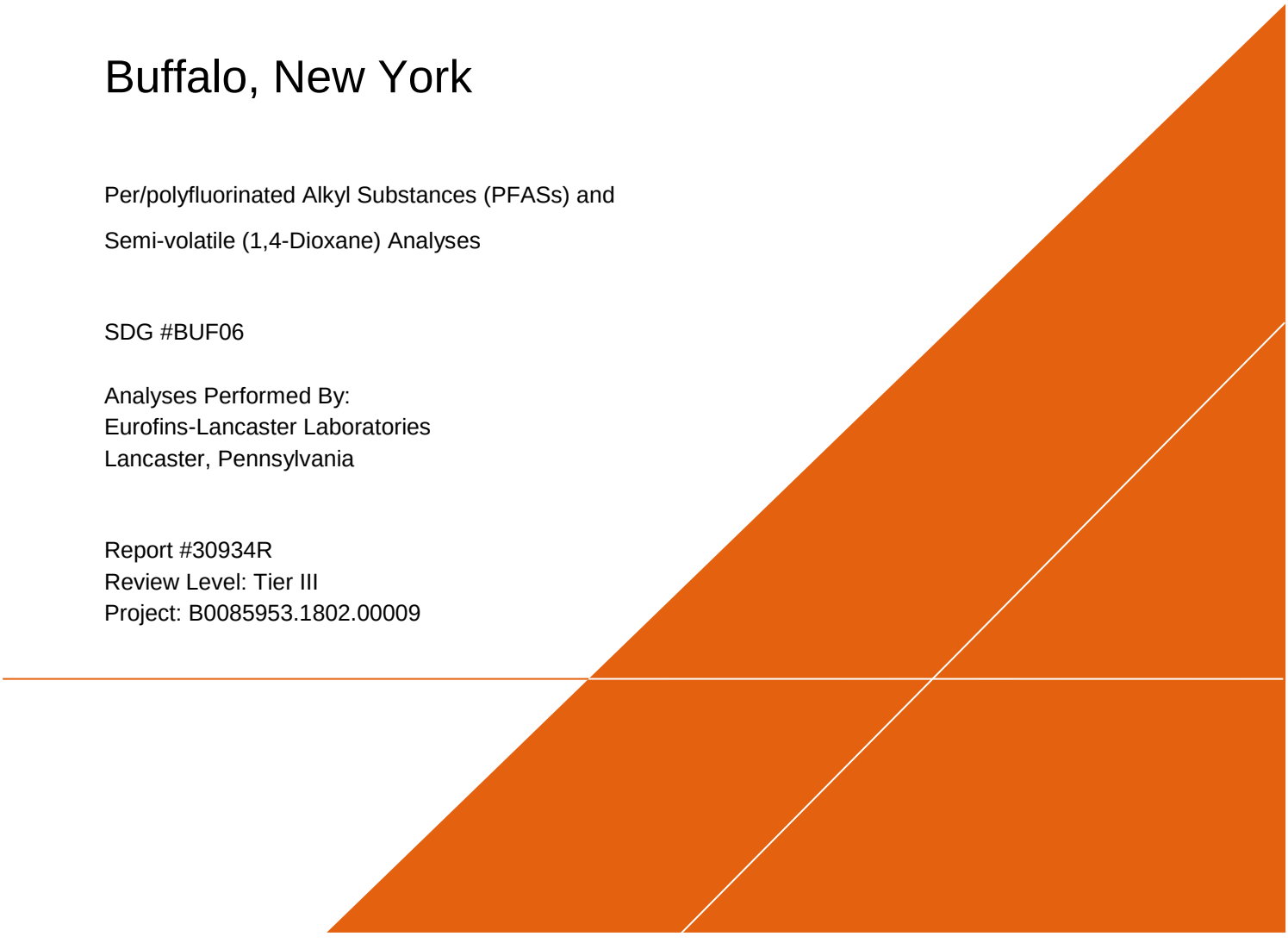
Per/polyfluorinated Alkyl Substances (PFASs) and

Semi-volatile (1,4-Dioxane) Analyses

SDG #BUF06

Analyses Performed By:
Eurofins-Lancaster Laboratories
Lancaster, Pennsylvania

Report #30934R
Review Level: Tier III
Project: B0085953.1802.00009



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #BUF06 for samples collected in association with the ExxonMobil-Buffalo Terminal, Buffalo, NY Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
						PFASs	SVOC
BUF06	MW-50	9683955	Groundwater	06/28/2018		X	X
	B-2MW	9683956	Groundwater	06/28/2018		X	X
	MW-34	9683957	Groundwater	06/28/2018		X	X
	MW-49	9683960	Groundwater	06/28/2018		X	X
	DUP-062818-OU2E	9683961	Groundwater	06/28/2018	MW-34	X	X
	FB-062818-OU2E	9683962	Groundwater	06/28/2018		X	

Note:

1. The matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location MW-34 for PFAs and 1,4-Dioxane analyses.

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods: 537 Modified (based on the laboratory standard operating procedure (SOP) "Polyfluorinated Alkyl Substances (PFAs) in Aqueous Samples by Method 537, Revision 1.1 Modified Using LC/MS/MS" (Doc #:T-PFAS-WI14355), Version 6, Rev. Date 03/01/18); and, Semi-volatile analysis by 8270D Selected Ion Monitoring (SIM). Data were reviewed in accordance with USEPA National Functional Guidelines for Organic Superfund Methods Data Review, EPA 540-R-2017-002, January 2017 (with reference to the historical USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, October 1999, as appropriate) and Department of Defense (DoD) Quality Systems Manual (QSM) 5.1.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound is considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

PER- and POLYFLUORINATED ALKYL SUBSTANCES (PFASs) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
EPA 537 Modified	Water	14 days from collection to extraction and 28 days from extraction to analysis	Cool to <6 °C; Extracts must be allowed to come to room temperature until analysis.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies the initial calibration standards exhibit a relative standard deviation (%RSD) less than the control limit (20%) or correlation coefficient greater than or equal to 0.995 for each target compound. All calibration points must be within a percent difference (%D) of ± 70%-130% of its true value. The lowest level calibration point for each compound must be within a %D of ± 50%-150% of its true value. A technical review of the data applies limits to all compounds with no exceptions.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration verification (CCV) standard must exhibit a percent difference (%D) less than the control limit (30%).

All compounds associated with the calibrations were within the specified control limits.

4. Extracted Internal Standard (EIS)

Labeled standards must be added to all field samples and QC samples prior to extraction. For aqueous samples prepared by serial dilution instead of solid phase extraction (SPE), they must be added to samples prior to analysis. EIS recoveries must be within DoD QSM 5.1 specified limits of 50% to150%. The DOD guidance is currently the only guidance available for the evaluation of EIS.

Sample locations associated with EIS exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Extracted Internal Standard	Associated PFASs Compounds	CAS #	Recovery
MW-50 B-2MW MW-49	13C3-PFBS	Perfluorobutanesulfonate (PFBS)	375-73-5	>UL
B-2MW MW--49	13C2-6:2-FTS	6:2 fluorotelomersulfonate (6:2-FTS)	27619-97-2	>UL

Notes:
UL = Upper control limit
LL = Lower control limit

The criteria used to evaluate the EIS recoveries are presented in the following table. In the case of an EIS deviation, the sample results associated with the EIS are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 150%	Non-detect	No Action
	Detect	
< 50% but > 25%	Non-detect	
	Detect	
< 25%	Non-detect	R
	Detect	J

As part of the isotope dilution analysis, the EIS are used for quantitation of the sample results, therefore the calculation of sample concentrations is adjusted for EIS recoveries. The data will not be qualified unless EIS recoveries are less than 25%.

5. Internal Standard Performance

Internal standards must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within -50% to +50% of the area measured in the ICAL midpoint standard. When an ICAL is not performed, the peak areas must be within 50% to 150% of the peak area measured in daily CCV.

Sample locations associated with internal standards exhibiting responses outside of the control limits are presented in the following table.

Sample Locations	Internal Standard	Associated PFASs compounds	CAS #	Response
MW-50	13C3-PFBA	Perfluorobutanoic acid (PFBA)	375-22-4	< LL but > 25%
MW-34		Perfluoropentanoic acid (PFPeA)	2706-90-3	
DUP-062818-OU2E		Perfluorobutanesulfonate (PFBS)	375-73-5	
B-2MW MW-49	13C3-PFBA	Perfluorobutanoic acid (PFBA)	375-22-4	< 25%
		Perfluoropentanoic acid (PFPeA)	2706-90-3	
		Perfluorobutanesulfonate (PFBS)	375-73-5	

Notes:
UL = Upper limit
LL = Lower limit

The criteria used to evaluate the internal standard responses are presented in the following table. In the case of an internal standard deviation, the compounds quantitated under the deviant internal standard are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 150%	Non-detect	No Action
	Detect	
< 50% but > 25%	Non-detect	No Action
	Detect	
< 25%	Non-detect	J
	Detect	J

Note: The internal standard responses have less of an impact on the reported concentration of compounds associated with sample results since this method employs the use of EIS. Therefore, the data less than the criteria have a been qualified as estimated.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within 70-130% or within 50-150% at the low-level fortified amount (near the RL). The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within 30%.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	CAS #	MS Recovery	MSD Recovery
MW-34	Perfluorobutanoic acid (PFBA)	375-22-4	>UL	AC
	Perfluoropentanoic acid (PFPeA)	2706-90-3	AC	>UL

Note:
AC Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/ Duplicate ID	Compound	CAS #	Sample Result	Duplicate Result	RPD
MW-34/ DUP-062818-OU2E	Perfluorobutanesulfonate (PFBS)	375-73-5	1.4 J	0.77 J	AC
	Perfluoroheptanesulfonate (PFHpS)	375-92-8	1.1 J	1.0 J	AC
	Perfluoroheptanoic acid (PFHpA)	375-85-9	2.0	1.8	AC

Sample ID/ Duplicate ID	Compound	CAS #	Sample Result	Duplicate Result	RPD
	Perfluorohexanesulfonate (PFHxS)	355-46-4	17	18	5.7%
	Perfluorohexanoic acid (PFHxA)	307-24-4	1.6 J	2.4 J	AC
	Perfluorononanoic acid (PFNA)	375-95-1	3.6	3.4	AC
	Perfluoro-octanesulfonate (PFOS)	1763-23-1	65	61	6.3%
	Perfluorooctanoic acid (PFOA)	335-67-1	3.7	3.3	AC

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

9. Compound Identification

Compounds are identified on the LC/MS by using the analytes relative retention time and ion spectra.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR PFASs

PFASs: EPA 537 Modified	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Instrument blanks					X
C. Field blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate(MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Extracted Internal Standards (EIS) %R		X	X		
Dilution Factor		X		X	
Moisture Content					X
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs (or %Ds)		X		X	
Continuing calibration %Ds		X		X	
Internal standard (injected)		X	X		
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD	Relative standard deviation
%R	Percent recovery
RPD	Relative percent difference
%D	Percent difference

SEMIVOLATILE ORGANIC COMPOUND (SVOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270D-SIM	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL and/or were non-detect. No qualification of the sample results was required.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable, and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the SVOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

8. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
MW-34/ DUP-062818-OU2E	1,4-Dioxane	U	U	AC

Notes:
AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270D SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X	X		
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content					X
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	

SVOCs: SW-846 8270D SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

SAMPLE COMPLIANCE REPORT

SAMPLE COMPLIANCE REPORT

Sample Delivery Group (SDG)	Sampling Date	Protocol	Sample ID	Matrix	Compliancy[1]					Noncompliance
					VOC	SVOC	PCB	MET	PFASs	
BUF06	06/28/2018	EPA 537 Mod and SW-846 8270D-SIM	MW-50	Groundwater	--	Yes	--	--	Yes	
	06/28/2018		B-2MW	Groundwater	--	Yes	--	--	No	PFAs-Internal standard response
	06/28/2018		MW-34	Groundwater	--	Yes	--	--	Yes	
	06/28/2018		MW-49	Groundwater	--	Yes	--	--	No	PFAs-Internal standard response
	06/28/2018		DUP-062818-OU2E	Groundwater	--	Yes	--	--	Yes	
	06/28/2018		FB-062818-OU2E	Groundwater	--	--	--	--	Yes	

Note:

1 Samples which are compliant with no added validation qualifiers are listed as "yes". Samples which are non-compliant or which have added qualifiers are listed as "no". A "no" designation does not necessarily indicate that the data have been rejected or are otherwise unusable.

VALIDATION PERFORMED BY: Lisa Horton

SIGNATURE: 

DATE: October 29, 2018

PEER REVIEW: Dennis Capria

DATE: November 14, 2018

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 473588 Group # 1960909 Sample # 9683955-962 **COC #** 552234

Client Information

Client: Arcadis	Acct. #:
Project Name/#: Former Terminal, Buffalo	PWSID #:
Project Manager: Milee Benoit	P.O. #:
Sampler: A. George	Quote #:
State where samples were collected: New York	For Compliance: Yes ☐ No ☐

Matrix: Soil ☐ Sediment ☐ Tissue ☐ | Water ☒ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: ____

Analysis Requested — Preservation and Filtration Codes

For Lab Use Only
FSC: ____
SCR#: ____

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Remarks
OU-2 East
PFAS in cooler 1 of 2
1,4-Dioxane cooler 2 of 2

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Sediment	Tissue	Water	Potable	Ground	Surface	NPDES	Other	Total # of Containers	PFAS Method 537 v1.1	1,4-Dioxane 8270D SIM
MW-50	6/28/18	0920	X					X		X				4	2	2
B-2MW	6/28/18	1025	X					X		X				4	2	2
MW-34	6/28/18	1306	X					X		X				4	2	2
MW-34 MS/MSD	6/28/18	1300	X					X		X				8	4	4
MW-49	6/28/18	1510	X					X		X				4	2	2
DUP-062818-OU2E	6/28/18	/	X					X		X				4	2	2
FB-062818-OU2E	6/28/18	1515	X					X		X				2	2	

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: Michael.benoit@arcadis.com

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP)
Type III (Reduced non-CLP)
NYSDEC Category A or B
Type VI (Raw Data Only)
NJ DKQP
MA MCP
TX TRRP-13
CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[illegible]	6/28/18	1630			
			MNR	6/29/18	0930

EDD Required? (Yes) No
If yes, format: Arcadis

Site-Specific QC (MS/MSD/Dup)? (Yes) No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ____ FedEx X Other ____

Temperature upon receipt 2.8 | 4.7 °C

eurofins | Lancaster Laboratories Environmental

Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value >= the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column >40%. The lower result is reported.
P^	Concentration difference between the primary and confirmation column > 40%. The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

REVISED

Sample Description: **MW-50 Grab Groundwater**
635 Elk St. - Buffalo, NY
31010 - Buffalo, NY

Project Name: **31010 - Buffalo, NY**

Submittal Date/Time: 06/29/2018 09:30
Collection Date/Time: 06/28/2018 09:20
SDG#: BUF06-01

ARCADIS U.S., Inc.
ELLE Sample #: WW 9683955
ELLE Group #: 1960908
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	**ug/l**	
14244	1,4-Dioxane	123-91-1	N.D.	0.3	0.1	1
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1 Modified**		**ng/l**	**ng/l**	**ng/l**	
14473	6:2 fluorotelomersulfonate	27619-97-2	N.D.	5.0	2.5	1
14473	8:2 fluorotelomersulfonate	39108-34-4	N.D.	15	5.0	1
14473	NEtFOSAA	2991-50-6	N.D.	7.5	2.5	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14473	NMeFOSAA	2355-31-9	N.D.	7.5	2.5	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14473	Perfluorobutanesulfonate	375-73-5	3.1	2.5	0.75	1
14473	Perfluorobutanoic acid	375-22-4	9.7 J	15	5.0	1
14473	Perfluorodecanesulfonate	335-77-3	N.D.	5.0	1.5	1
14473	Perfluorodecanoic acid	335-76-2	5.6	5.0	2.3	1
14473	Perfluorododecanoic acid	307-55-1	N.D.	5.0	1.3	1
14473	Perfluoroheptanesulfonate	375-92-8	N.D.	5.0	1.0	1
14473	Perfluoroheptanoic acid	375-85-9	11	2.5	1.0	1
14473	Perfluorohexanesulfonate	355-46-4	2.8 J	5.0	1.0	1
14473	Perfluorohexanoic acid	307-24-4	4.9 J	5.0	1.0	1
14473	Perfluorononanoic acid	375-95-1	150	5.0	1.0	1
14473	Perfluorooctanesulfonamide	754-91-6	N.D.	7.5	1.3	1
14473	Perfluoro-octanesulfonate	1763-23-1	11	5.0	1.0	1
14473	Perfluorooctanoic acid	335-67-1	14	2.5	0.75	1
14473	Perfluoropentanoic acid	2706-90-3	N.D.	15	5.0	1
14473	Perfluorotetradecanoic acid	376-06-7	N.D.	2.5	0.75	1
14473	Perfluorotridecanoic acid	72629-94-8	N.D.	2.5	1.0	1
14473	Perfluoroundecanoic acid	2058-94-8	5.3	5.0	1.0	1

The recovery for labeled compound used as extraction standards is outside of QC acceptance limits as noted on the QC Summary due to the matrix of the sample.

The sample injection internal standard peak areas were outside of the QC limits for both the initial injection and the re-injection. The values here are from the initial injection of the sample.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18184WAW026	08/09/2018 15:22	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAW026	07/03/2018 19:15	Mathias Okpo	1

*=This limit was used in the evaluation of the final result

REVISED

Sample Description: **MW-50 Grab Groundwater**
635 Elk St. - Buffalo, NY
31010 - Buffalo, NY

Project Name: **31010 - Buffalo, NY**

Submittal Date/Time: 06/29/2018 09:30
Collection Date/Time: 06/28/2018 09:20
SDG#: BUF06-01

ARCADIS U.S., Inc.
ELLE Sample #: WW 9683955
ELLE Group #: 1960908
Matrix: Groundwater

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14473	PFAS in Water by LC/MS/MS	EPA 537 Version 1.1 Modified	1	18192013	07/12/2018 14:52	Jason W Knight	1
14091	PFAS Water Prep	EPA 537 Version 1.1 Modified	2	18192013	07/11/2018 16:50	Danielle D McCully	1

*=This limit was used in the evaluation of the final result

REVISED

Sample Description: **B-2MW Grab Groundwater**
635 Elk St. - Buffalo, NY
31010 - Buffalo, NY

Project Name: **31010 - Buffalo, NY**

Submittal Date/Time: 06/29/2018 09:30
Collection Date/Time: 06/28/2018 10:25
SDG#: BUF06-02

ARCADIS U.S., Inc.
ELLE Sample #: WW 9683956
ELLE Group #: 1960908
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	**ug/l**	
14244	1,4-Dioxane	123-91-1	N.D.	0.3	0.1	1
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1 Modified**		**ng/l**	**ng/l**	**ng/l**	
14473	6:2 fluorotelomersulfonate	27619-97-2	N.D.	5.0	2.5	1
14473	8:2 fluorotelomersulfonate	39108-34-4	N.D.	15	5.0	1
14473	NEtFOSAA	2991-50-6	N.D.	7.4	2.5	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14473	NMeFOSAA	2355-31-9	N.D.	7.4	2.5	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14473	Perfluorobutanesulfonate	375-73-5	8.8 J	2.5	0.74	1
14473	Perfluorobutanoic acid	375-22-4	28 J	15	5.0	1
14473	Perfluorodecanesulfonate	335-77-3	N.D.	5.0	1.5	1
14473	Perfluorodecanoic acid	335-76-2	N.D.	5.0	2.2	1
14473	Perfluorododecanoic acid	307-55-1	N.D.	5.0	1.2	1
14473	Perfluoroheptanesulfonate	375-92-8	N.D.	5.0	0.99	1
14473	Perfluoroheptanoic acid	375-85-9	3.5	2.5	0.99	1
14473	Perfluorohexanesulfonate	355-46-4	19	5.0	0.99	1
14473	Perfluorohexanoic acid	307-24-4	5.8	5.0	0.99	1
14473	Perfluorononanoic acid	375-95-1	4.1 J	5.0	0.99	1
14473	Perfluorooctanesulfonamide	754-91-6	N.D.	7.4	1.2	1
14473	Perfluoro-octanesulfonate	1763-23-1	16	5.0	0.99	1
14473	Perfluorooctanoic acid	335-67-1	7.3	2.5	0.74	1
14473	Perfluoropentanoic acid	2706-90-3	N.D. J	15	5.0	1
14473	Perfluorotetradecanoic acid	376-06-7	N.D.	2.5	0.74	1
14473	Perfluorotridecanoic acid	72629-94-8	N.D.	2.5	0.99	1
14473	Perfluoroundecanoic acid	2058-94-8	N.D.	5.0	0.99	1

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for labeled compound used as extraction standards is outside of QC acceptance limits as noted on the QC Summary due to the matrix of the sample.

The sample injection internal standard peak areas were outside of the QC limits for both the initial injection and the re-injection. The values here are from the initial injection of the sample.

The recovery for labeled compound used as extraction standards is outside of QC acceptance limits as noted on the QC Summary.

*=This limit was used in the evaluation of the final result

REVISED

Sample Description: **B-2MW Grab Groundwater**
635 Elk St. - Buffalo, NY
31010 - Buffalo, NY

Project Name: **31010 - Buffalo, NY**

Submittal Date/Time: 06/29/2018 09:30
Collection Date/Time: 06/28/2018 10:25
SDG#: BUF06-02

ARCADIS U.S., Inc.
ELLE Sample #: WW 9683956
ELLE Group #: 1960908
Matrix: Groundwater

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18184WAW026	08/09/2018 15:51	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAW026	07/03/2018 19:15	Mathias Okpo	1
14473	PFAS in Water by LC/MS/MS	EPA 537 Version 1.1 Modified	1	18192013	07/12/2018 15:11	Jason W Knight	1
14091	PFAS Water Prep	EPA 537 Version 1.1 Modified	2	18192013	07/11/2018 16:50	Danielle D McCully	1

*=This limit was used in the evaluation of the final result

REVISED

Sample Description: **MW-34 Grab Groundwater**
635 Elk St. - Buffalo, NY
31010 - Buffalo, NY

Project Name: **31010 - Buffalo, NY**

Submittal Date/Time: 06/29/2018 09:30
Collection Date/Time: 06/28/2018 13:00
SDG#: BUF06-03BKG

ARCADIS U.S., Inc.
ELLE Sample #: WW 9683957
ELLE Group #: 1960908
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	**ug/l**	
14244	1,4-Dioxane	123-91-1	N.D.	0.3	0.1	1
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1 Modified**		**ng/l**	**ng/l**	**ng/l**	
14473	6:2 fluorotelomersulfonate	27619-97-2	N.D.	3.3	1.6	1
14473	8:2 fluorotelomersulfonate	39108-34-4	N.D.	9.9	3.3	1
14473	NEtFOSAA	2991-50-6	N.D.	4.9	1.6	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14473	NMeFOSAA	2355-31-9	N.D.	4.9	1.6	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14473	Perfluorobutanesulfonate	375-73-5	1.4 J	1.6	0.49	1
14473	Perfluorobutanoic acid	375-22-4	N.D.	9.9	3.3	1
14473	Perfluorodecanesulfonate	335-77-3	N.D.	3.3	0.99	1
14473	Perfluorodecanoic acid	335-76-2	N.D.	3.3	1.5	1
14473	Perfluorododecanoic acid	307-55-1	N.D.	3.3	0.82	1
14473	Perfluoroheptanesulfonate	375-92-8	1.1 J	3.3	0.66	1
14473	Perfluoroheptanoic acid	375-85-9	2.0	1.6	0.66	1
14473	Perfluorohexanesulfonate	355-46-4	17	3.3	0.66	1
14473	Perfluorohexanoic acid	307-24-4	1.6 J	3.3	0.66	1
14473	Perfluorononanoic acid	375-95-1	3.6	3.3	0.66	1
14473	Perfluorooctanesulfonamide	754-91-6	N.D.	4.9	0.82	1
14473	Perfluoro-octanesulfonate	1763-23-1	65	3.3	0.66	1
14473	Perfluorooctanoic acid	335-67-1	3.7	1.6	0.49	1
14473	Perfluoropentanoic acid	2706-90-3	N.D.	9.9	3.3	1
14473	Perfluorotetradecanoic acid	376-06-7	N.D.	1.6	0.49	1
14473	Perfluorotridecanoic acid	72629-94-8	N.D.	1.6	0.66	1
14473	Perfluoroundecanoic acid	2058-94-8	N.D.	3.3	0.66	1

The recovery for the sample injection standard and the labeled compound used as extraction standard is outside the QC acceptance limits as noted on the QC Summary. The recovery for the injection standard and labeled compound used as extraction standard is also outside the QC acceptance limits in the associated matrix spike and matrix spike duplicate, indicating a matrix effect.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18184WAW026	08/09/2018 13:58	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAW026	07/03/2018 19:15	Mathias Okpo	1
14473	PFAS in Water by LC/MS/MS	EPA 537 Version 1.1 Modified	1	18192013	07/12/2018 15:29	Jason W Knight	1

*=This limit was used in the evaluation of the final result

REVISED

Sample Description: **MW-34 Grab Groundwater**
635 Elk St. - Buffalo, NY
31010 - Buffalo, NY

Project Name: **31010 - Buffalo, NY**

Submittal Date/Time: 06/29/2018 09:30
Collection Date/Time: 06/28/2018 13:00
SDG#: BUF06-03BKG

ARCADIS U.S., Inc.
ELLE Sample #: WW 9683957
ELLE Group #: 1960908
Matrix: Groundwater

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14091	PFAS Water Prep	EPA 537 Version 1.1 Modified	2	18192013	07/11/2018 16:50	Danielle D McCully	1

*=This limit was used in the evaluation of the final result

REVISED

Sample Description: **MW-49 Grab Groundwater**
635 Elk St. - Buffalo, NY
31010 - Buffalo, NY

Project Name: **31010 - Buffalo, NY**

Submittal Date/Time: 06/29/2018 09:30
Collection Date/Time: 06/28/2018 15:10
SDG#: BUF06-04

ARCADIS U.S., Inc.
ELLE Sample #: WW 9683960
ELLE Group #: 1960908
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	**ug/l**	
14244	1,4-Dioxane	123-91-1	N.D.	0.3	0.1	1
	The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and no target analytes were detected, the data is reported.					
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1 Modified**		**ng/l**	**ng/l**	**ng/l**	
14473	6:2 fluorotelomersulfonate	27619-97-2	N.D.	3.4	1.7	1
14473	8:2 fluorotelomersulfonate	39108-34-4	N.D.	10	3.4	1
14473	NEtFOSAA	2991-50-6	N.D.	5.1	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14473	NMeFOSAA	2355-31-9	N.D.	5.1	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14473	Perfluorobutanesulfonate	375-73-5	7.3 J	1.7	0.51	1
14473	Perfluorobutanoic acid	375-22-4	110 J	10	3.4	1
14473	Perfluorodecanesulfonate	335-77-3	N.D.	3.4	1.0	1
14473	Perfluorodecanoic acid	335-76-2	N.D.	3.4	1.5	1
14473	Perfluorododecanoic acid	307-55-1	N.D.	3.4	0.85	1
14473	Perfluoroheptanesulfonate	375-92-8	N.D.	3.4	0.68	1
14473	Perfluoroheptanoic acid	375-85-9	3.0	1.7	0.68	1
14473	Perfluorohexanesulfonate	355-46-4	3.0 J	3.4	0.68	1
14473	Perfluorohexanoic acid	307-24-4	7.7	3.4	0.68	1
14473	Perfluorononanoic acid	375-95-1	2.6 J	3.4	0.68	1
14473	Perfluorooctanesulfonamide	754-91-6	N.D.	5.1	0.85	1
14473	Perfluoro-octanesulfonate	1763-23-1	4.2	3.4	0.68	1
14473	Perfluorooctanoic acid	335-67-1	12	1.7	0.51	1
14473	Perfluoropentanoic acid	2706-90-3	7.8 J	10	3.4	1
14473	Perfluorotetradecanoic acid	376-06-7	N.D.	1.7	0.51	1
14473	Perfluorotridecanoic acid	72629-94-8	N.D.	1.7	0.68	1
14473	Perfluoroundecanoic acid	2058-94-8	N.D.	3.4	0.68	1

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for labeled compound used as extraction standards is outside of QC acceptance limits as noted on the QC Summary due to the matrix of the sample.

The sample injection internal standard peak areas were outside of the QC limits for both the initial injection and the re-injection. The values here are from the initial injection of the sample.

The recovery for labeled compound used as extraction standards

*=This limit was used in the evaluation of the final result

REVISED

Sample Description: **MW-49 Grab Groundwater**
635 Elk St. - Buffalo, NY
31010 - Buffalo, NY

Project Name: **31010 - Buffalo, NY**

Submittal Date/Time: 06/29/2018 09:30
Collection Date/Time: 06/28/2018 15:10
SDG#: BUF06-04

ARCADIS U.S., Inc.
ELLE Sample #: WW 9683960
ELLE Group #: 1960908
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor

is outside of QC acceptance limits as noted on the QC Summary.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18184WAW026	08/09/2018 16:19	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAW026	07/03/2018 19:15	Mathias Okpo	1
14473	PFAS in Water by LC/MS/MS	EPA 537 Version 1.1 Modified	1	18192013	07/12/2018 15:56	Jason W Knight	1
14091	PFAS Water Prep	EPA 537 Version 1.1 Modified	2	18192013	07/11/2018 16:50	Danielle D McCully	1

*=This limit was used in the evaluation of the final result

REVISED

Sample Description: **DUP-062818-OU2E Grab Groundwater**
635 Elk St. - Buffalo, NY
31010 - Buffalo, NY

Project Name: **31010 - Buffalo, NY**

Submittal Date/Time: 06/29/2018 09:30
Collection Date/Time: 06/28/2018
SDG#: BUF06-05FD

ARCADIS U.S., Inc.
ELLE Sample #: WW 9683961
ELLE Group #: 1960908
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	**ug/l**	
14244	1,4-Dioxane	123-91-1	N.D.	0.3	0.1	1
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1 Modified**		**ng/l**	**ng/l**	**ng/l**	
14473	6:2 fluorotelomersulfonate	27619-97-2	N.D.	3.3	1.7	1
14473	8:2 fluorotelomersulfonate	39108-34-4	N.D.	10	3.3	1
14473	NEtFOSAA	2991-50-6	N.D.	5.0	1.7	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14473	NMeFOSAA	2355-31-9	N.D.	5.0	1.7	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14473	Perfluorobutanesulfonate	375-73-5	0.77 J	1.7	0.50	1
14473	Perfluorobutanoic acid	375-22-4	N.D.	10	3.3	1
14473	Perfluorodecanesulfonate	335-77-3	N.D.	3.3	1.0	1
14473	Perfluorodecanoic acid	335-76-2	N.D.	3.3	1.5	1
14473	Perfluorododecanoic acid	307-55-1	N.D.	3.3	0.83	1
14473	Perfluoroheptanesulfonate	375-92-8	1.0 J	3.3	0.67	1
14473	Perfluoroheptanoic acid	375-85-9	1.8	1.7	0.67	1
14473	Perfluorohexanesulfonate	355-46-4	18	3.3	0.67	1
14473	Perfluorohexanoic acid	307-24-4	2.4 J	3.3	0.67	1
14473	Perfluorononanoic acid	375-95-1	3.4	3.3	0.67	1
14473	Perfluorooctanesulfonamide	754-91-6	N.D.	5.0	0.83	1
14473	Perfluoro-octanesulfonate	1763-23-1	61	3.3	0.67	1
14473	Perfluorooctanoic acid	335-67-1	3.3	1.7	0.50	1
14473	Perfluoropentanoic acid	2706-90-3	N.D.	10	3.3	1
14473	Perfluorotetradecanoic acid	376-06-7	N.D.	1.7	0.50	1
14473	Perfluorotridecanoic acid	72629-94-8	N.D.	1.7	0.67	1
14473	Perfluoroundecanoic acid	2058-94-8	N.D.	3.3	0.67	1

The sample injection internal standard peak areas were outside of the QC limits for both the initial injection and the re-injection. The values here are from the initial injection of the sample.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18184WAW026	08/09/2018 16:47	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAW026	07/03/2018 19:15	Mathias Okpo	1
14473	PFAS in Water by LC/MS/MS	EPA 537 Version 1.1 Modified	1	18192013	07/12/2018 16:23	Jason W Knight	1
14091	PFAS Water Prep	EPA 537 Version 1.1 Modified	2	18192013	07/11/2018 16:50	Danielle D McCully	1

*=This limit was used in the evaluation of the final result

REVISED

Sample Description: **FB-062818-OU2E Grab Groundwater**
635 Elk St. - Buffalo, NY
31010 - Buffalo, NY

Project Name: **31010 - Buffalo, NY**

Submittal Date/Time: 06/29/2018 09:30
Collection Date/Time: 06/28/2018 15:45
SDG#: BUF06-06FB

ARCADIS U.S., Inc.
ELLE Sample #: WW 9683962
ELLE Group #: 1960908
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
LC/MS/MS Miscellaneous	**EPA 537 Version 1.1 Modified**		**ng/l**	**ng/l**	**ng/l**	
14473	6:2 fluorotelomersulfonate	27619-97-2	N.D.	1.7	0.87	1
14473	8:2 fluorotelomersulfonate	39108-34-4	N.D.	5.2	1.7	1
14473	NEtFOSAA	2991-50-6	N.D.	2.6	0.87	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14473	NMeFOSAA	2355-31-9	N.D.	2.6	0.87	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14473	Perfluorobutanesulfonate	375-73-5	N.D.	0.87	0.26	1
14473	Perfluorobutanoic acid	375-22-4	N.D.	5.2	1.7	1
14473	Perfluorodecanesulfonate	335-77-3	N.D.	1.7	0.52	1
14473	Perfluorodecanoic acid	335-76-2	N.D.	1.7	0.78	1
14473	Perfluorododecanoic acid	307-55-1	N.D.	1.7	0.43	1
14473	Perfluoroheptanesulfonate	375-92-8	N.D.	1.7	0.35	1
14473	Perfluoroheptanoic acid	375-85-9	N.D.	0.87	0.35	1
14473	Perfluorohexanesulfonate	355-46-4	N.D.	1.7	0.35	1
14473	Perfluorohexanoic acid	307-24-4	N.D.	1.7	0.35	1
14473	Perfluorononanoic acid	375-95-1	N.D.	1.7	0.35	1
14473	Perfluorooctanesulfonamide	754-91-6	N.D.	2.6	0.43	1
14473	Perfluoro-octanesulfonate	1763-23-1	N.D.	1.7	0.35	1
14473	Perfluorooctanoic acid	335-67-1	N.D.	0.87	0.26	1
14473	Perfluoropentanoic acid	2706-90-3	N.D.	5.2	1.7	1
14473	Perfluorotetradecanoic acid	376-06-7	N.D.	0.87	0.26	1
14473	Perfluorotridecanoic acid	72629-94-8	N.D.	0.87	0.35	1
14473	Perfluoroundecanoic acid	2058-94-8	N.D.	1.7	0.35	1

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14473	PFAS in Water by LC/MS/MS	EPA 537 Version 1.1 Modified	1	18192013	07/12/2018 16:41	Jason W Knight	1
14091	PFAS Water Prep	EPA 537 Version 1.1 Modified	3	18192013	07/11/2018 16:50	Danielle D McCully	1

*=This limit was used in the evaluation of the final result